

## **CRUISE REPORT**

Southeast Fishery-Independent Survey (SEFIS)

R/V *Savannah* Cruise SH-12-25

7 – 18 July 2012

Total Number of Sea Days - 12

U.S. Department of Commerce  
National Oceanic and Atmospheric Administration  
National Marine Fisheries Service  
Southeast Fisheries Science Center  
Beaufort Laboratory  
101 Pivers Island Rd.  
Beaufort, NC 28516

185 camera-trap deployments  
34 CTD casts

## INTRODUCTION

The R/V *Savannah* departed Savannah, GA, on 7 July 2012 for a Southeast Fishery-Independent Survey (SEFIS) research cruise in continental shelf and shelf-break waters off the southeastern US. SEFIS was created by the National Marine Fisheries Service in 2010 and operates out of the Beaufort Laboratory. This survey conducts applied fishery-independent sampling and related research focusing on the assessment of spatial variability in distribution and abundance of red snapper and other reef species within the snapper-grouper complex, via data collected from fish traps, video cameras, and acoustics. During this survey, chevron trap catches and associated underwater video recordings were collected from randomly selected stations on known hardbottom habitats between 28.83° N and 31.40° N. Additionally, non-random stations on known hardbottom habitat, and recon stations on suspected hardbottom habitat, were also sampled. A total of 185 stations were sampled with camera-trap gear over 12 sea days between 20 and 63 meter depths.

## OBJECTIVES

1. Increase the spatial footprint and sample size of fishery-independent sampling in southeast US waters. Baited chevron traps, with 2 or 3 mounted high-definition video cameras, were utilized for (a) hardbottom reef fish community assessments, (b) collection of reef fish for biological samples (e.g., otoliths and gonads), and (c) comparative gear sampling (cameras versus traps).
2. Use video cameras on chevron traps to address trap selectivity issues, locate and describe hardbottom habitats, and provide an additional index of abundance for stock assessments.
3. Use a CTD instrument package to collect environmental data (temperature, salinity, dissolved oxygen, and turbidity) at camera-trap sampling locations.

## METHODS

### Camera-Trap Sampling

Camera-trap gear consisted of two or three high definition video cameras mounted to a chevron fish trap. Chevron traps were constructed out of plastic-coated wire mesh. A Canon® camera (model HF S200) was attached above the mouth of the trap, and a GoPro® camera (model HD Hero with a flat-lens housing) was attached above the nose of the trap (Figure 1). Additionally, some traps had a third camera (GoPro) attached to the side of the trap, looking inward towards the mouth opening, so that reef fish entries and exits could be recorded. Traps were baited with Atlantic menhaden, *Brevoortia tyrannus*, and video cameras were set to record before deployment. Camera-traps were deployed at randomly selected stations at least 200 meters apart on suspected or known hardbottom habitats, and left to soak for approximately 90 minutes. Camera-traps were most often deployed in sets of six. A CTD cast (see environmental data collection) was conducted during the 90-minute soak time for each trap set. Fish catches were processed after trap retrieval. All fish were counted, weighed, and measured to the nearest millimeter. Individuals of select species (e.g., species in the

snapper-grouper complex) were further processed for additional lengths and biological samples (otoliths, gonads, and DNA). Video files were downloaded and backed up on media storage devices. Biological samples were sent to the Marine Resources Monitoring, Assessment, and Prediction (MARMAP) Program laboratory for processing, and video files were brought to the NMFS Beaufort laboratory for further processing and analysis.

### **Environmental Data Collection**

Environmental data were collected with a Seabird “Conductivity, Temperature and Depth” instrument package (CTD; model SBE 25) and Scientific Computer System software (SCS; version 4). CTD casts were conducted near the middle of each camera-trap soak period; instruments were lowered to within 2 meters of the bottom. Numerous water profile measurements were collected, including temperature ( $^{\circ}$ C), salinity (psu), dissolved oxygen (mg/L), and turbidity (% transmission). CTD data were archived for further processing at the Beaufort laboratory. SCS software was used to collect specific information for each fishing and CTD event, including soak time/cast duration as well as start and end latitude, longitude, and depth (m).

## **SURVEY RESULTS**

### **Camera-Trap Sampling**

185 stations were sampled with camera-trap gear (Table 1, Figure 2). No traps or cameras were lost on the cruise.

### **Environmental Data Collection**

34 CTD casts were conducted during the cruise (Table 1, Figure 2). CTD data will be processed back at the lab using Seabird SBE Data Processing software (version 7.2), and archived in a database at the NMFS–Beaufort Laboratory for future analysis.

### **Hook-and-line Sampling**

Opportunistic hook-and-line sampling for reef fish occurred twice during the cruise, with the main goal of collecting fish for diet and additional life history samples. Hook-and-line specimens were also worked up for biological samples (otoliths and spines).

Table 1. Summary of station coordinates, depth (m), date and time for each fishing event (camera-trap, Gear=324; hook-and-line, Gear=014) and CTD cast (Gear=298) conducted on the SH-12-25 survey. Times were recorded in Coordinated Universal Time (UTC).

Collection	Gear ID	Date	Start Time	Start Latitude	Start Longitude	Start Depth
123283	324	7/7/2012	21:37	31.41	-80.60	26
123284	324	7/7/2012	21:42	31.40	-80.59	26
123285	324	7/7/2012	21:49	31.40	-80.59	27
123286	298	7/7/2012	21:59	31.41	-80.60	28
123287	324	7/8/2012	11:54	31.24	-79.88	50
123288	324	7/8/2012	12:04	31.23	-79.89	50
123289	324	7/8/2012	12:11	31.23	-79.89	48
123290	324	7/8/2012	12:17	31.22	-79.89	49
123291	324	7/8/2012	12:22	31.22	-79.89	49
123292	324	7/8/2012	12:38	31.20	-79.90	50
123293	298	7/8/2012	13:09	31.24	-79.88	57
123294	324	7/8/2012	15:08	31.16	-79.91	55
123295	324	7/8/2012	15:16	31.15	-79.91	52
123296	324	7/8/2012	15:23	31.14	-79.91	53
123297	324	7/8/2012	15:28	31.14	-79.92	52
123298	324	7/8/2012	15:34	31.13	-79.92	51
123299	324	7/8/2012	15:41	31.12	-79.92	51
123300	298	7/8/2012	16:14	31.17	-79.90	60
123301	324	7/8/2012	20:09	31.07	-80.03	50
123302	324	7/8/2012	20:18	31.06	-80.03	50
123303	324	7/8/2012	20:22	31.06	-80.04	49
123304	324	7/8/2012	20:29	31.06	-80.03	50
123305	324	7/8/2012	20:34	31.05	-80.04	49
123306	324	7/8/2012	20:40	31.05	-80.04	48
123307	298	7/8/2012	20:59	31.07	-80.02	50
123308	324	7/9/2012	11:45	30.76	-80.22	44
123309	324	7/9/2012	11:49	30.76	-80.22	42
123310	324	7/9/2012	11:56	30.75	-80.22	44
123311	324	7/9/2012	12:00	30.75	-80.21	44
123312	324	7/9/2012	12:11	30.74	-80.22	42
123313	324	7/9/2012	12:16	30.73	-80.22	44
123314	298	7/9/2012	12:36	30.76	-80.21	43
123315	324	7/9/2012	16:36	30.91	-80.59	35
123316	324	7/9/2012	16:43	30.91	-80.60	35
123317	324	7/9/2012	16:45	30.91	-80.61	35

123318	324	7/9/2012	16:51	30.91	-80.61	35
123319	324	7/9/2012	16:57	30.91	-80.61	35
123320	324	7/9/2012	17:01	30.91	-80.62	35
123321	298	7/9/2012	17:49	30.91	-80.59	35
123322	324	7/9/2012	20:19	30.90	-80.60	33
123323	324	7/9/2012	20:23	30.90	-80.60	34
123324	324	7/9/2012	20:27	30.90	-80.60	34
123325	324	7/9/2012	20:35	30.89	-80.62	33
123326	324	7/9/2012	20:38	30.89	-80.62	33
123327	324	7/9/2012	20:45	30.89	-80.61	34
123328	298	7/9/2012	21:02	30.91	-80.60	34
123329	324	7/10/2012	11:50	30.59	-80.15	54
123330	324	7/10/2012	11:57	30.59	-80.16	50
123331	324	7/10/2012	12:04	30.58	-80.16	49
123332	324	7/10/2012	12:09	30.58	-80.16	50
123333	324	7/10/2012	12:15	30.57	-80.16	49
123334	324	7/10/2012	12:19	30.57	-80.16	53
123335	298	7/10/2012	12:40	30.59	-80.15	59
123336	324	7/10/2012	15:12	30.65	-80.21	43
123337	324	7/10/2012	15:16	30.64	-80.21	44
123338	324	7/10/2012	15:20	30.64	-80.21	42
123339	324	7/10/2012	15:23	30.64	-80.21	45
123340	324	7/10/2012	15:29	30.63	-80.21	44
123341	324	7/10/2012	15:33	30.63	-80.21	46
123342	298	7/10/2012	15:46	30.65	-80.21	44
123343	324	7/10/2012	20:05	30.53	-80.46	38
123344	324	7/10/2012	20:09	30.52	-80.46	37
123345	324	7/10/2012	20:15	30.52	-80.47	39
123346	324	7/10/2012	20:20	30.52	-80.48	38
123347	324	7/10/2012	20:25	30.51	-80.48	38
123348	324	7/10/2012	20:37	30.50	-80.45	38
123349	298	7/10/2012	20:55	30.53	-80.46	38
123350	324	7/11/2012	11:55	29.98	-80.28	56
123351	324	7/11/2012	12:04	29.97	-80.29	52
123352	324	7/11/2012	12:10	29.97	-80.28	56
123353	324	7/11/2012	12:14	29.96	-80.28	56
123354	324	7/11/2012	12:19	29.95	-80.28	55
123355	324	7/11/2012	12:25	29.95	-80.28	55
123356	298	7/11/2012	12:46	29.98	-80.28	58
123357	324	7/11/2012	15:45	29.94	-80.49	42
123358	324	7/11/2012	15:51	29.94	-80.49	41

123359	324	7/11/2012	15:55	29.95	-80.49	44
123360	324	7/11/2012	16:00	29.95	-80.50	41
123361	324	7/11/2012	16:08	29.94	-80.50	43
123362	324	7/11/2012	16:19	29.93	-80.52	37
123363	298	7/11/2012	16:45	29.95	-80.48	42
123364	324	7/11/2012	20:09	29.86	-80.54	37
123365	324	7/11/2012	20:12	29.86	-80.54	38
123366	324	7/11/2012	20:19	29.86	-80.55	38
123367	324	7/11/2012	20:32	29.86	-80.53	38
123368	324	7/11/2012	20:36	29.85	-80.53	38
123369	324	7/11/2012	20:40	29.85	-80.53	37
123370	298	7/11/2012	20:55	29.86	-80.54	37
123371	324	7/12/2012	12:54	29.56	-80.39	41
123372	324	7/12/2012	12:59	29.56	-80.39	39
123373	324	7/12/2012	13:04	29.56	-80.39	41
123374	324	7/12/2012	13:09	29.56	-80.39	40
123375	324	7/12/2012	13:13	29.55	-80.39	40
123376	324	7/12/2012	13:18	29.55	-80.39	41
123377	298	7/12/2012	13:30	29.57	-80.39	41
123378	324	7/12/2012	15:38	29.55	-80.39	41
123379	324	7/12/2012	15:41	29.55	-80.39	42
123380	324	7/12/2012	15:45	29.54	-80.39	42
123381	324	7/12/2012	15:50	29.54	-80.39	42
123382	324	7/12/2012	15:54	29.54	-80.39	41
123383	324	7/12/2012	15:59	29.54	-80.38	42
123384	298	7/12/2012	16:10	29.55	-80.39	44
123385	324	7/12/2012	18:34	29.54	-80.43	38
123386	324	7/12/2012	18:37	29.54	-80.42	38
123387	324	7/12/2012	18:42	29.54	-80.42	39
123388	324	7/12/2012	18:47	29.53	-80.42	40
123389	324	7/12/2012	18:51	29.53	-80.42	39
123390	324	7/12/2012	18:56	29.53	-80.42	39
123391	298	7/12/2012	19:07	29.54	-80.43	36
123392	324	7/13/2012	11:49	29.33	-80.51	31
123393	324	7/13/2012	11:53	29.32	-80.51	32
123394	324	7/13/2012	11:58	29.32	-80.51	30
123395	324	7/13/2012	12:06	29.32	-80.51	32
123396	324	7/13/2012	12:13	29.32	-80.50	32
123397	324	7/13/2012	12:16	29.33	-80.50	33
123398	298	7/13/2012	12:29	29.33	-80.51	32
123399	324	7/13/2012	14:52	29.32	-80.40	31

123400	324	7/13/2012	14:54	29.32	-80.40	32
123401	324	7/13/2012	15:04	29.32	-80.41	32
123402	324	7/13/2012	15:06	29.32	-80.41	31
123403	324	7/13/2012	15:10	29.33	-80.41	30
123404	298	7/13/2012	15:27	29.32	-80.40	30
123405	324	7/13/2012	17:23	29.31	-80.39	32
123406	324	7/13/2012	17:29	29.31	-80.39	30
123407	324	7/13/2012	17:32	29.30	-80.39	33
123408	324	7/13/2012	17:38	29.30	-80.39	30
123409	324	7/13/2012	17:43	29.30	-80.38	33
123410	298	7/13/2012	17:56	29.31	-80.39	30
123411	324	7/14/2012	20:52	29.17	-80.31	44
123412	324	7/14/2012	21:07	29.15	-80.31	44
123413	298	7/13/2012	21:25	29.18	-80.31	44
123414	324	7/14/2012	11:27	29.17	-80.24	52
123415	324	7/14/2012	11:35	29.16	-80.23	51
123416	324	7/14/2012	11:40	29.16	-80.23	52
123417	324	7/14/2012	11:45	29.15	-80.23	53
123418	324	7/14/2012	11:53	29.15	-80.23	52
123419	298	7/14/2012	12:08	29.17	-80.24	53
123420	324	7/14/2012	14:57	28.98	-80.19	52
123421	324	7/14/2012	15:01	28.98	-80.19	52
123422	324	7/14/2012	15:06	28.97	-80.19	52
123423	324	7/14/2012	15:11	28.97	-80.18	52
123424	324	7/14/2012	15:17	28.97	-80.18	52
123425	298	7/14/2012	15:31	28.98	-80.19	53
123426	324	7/14/2012	18:12	28.89	-80.27	41
123427	324	7/14/2012	18:20	28.89	-80.27	40
123428	324	7/14/2012	18:28	28.88	-80.27	40
123429	324	7/14/2012	18:38	28.87	-80.26	43
123430	324	7/14/2012	18:48	28.86	-80.26	43
123431	324	7/14/2012	18:59	28.85	-80.25	42
123432	298	7/14/2012	19:27	28.90	-80.27	41
123433	324	7/14/2012	21:53	28.84	-80.44	21
123434	324	7/14/2012	22:00	28.83	-80.44	20
123435	298	7/14/2012	22:07	28.84	-80.44	20
123436	324	7/15/2012	11:48	29.95	-80.28	56
123437	324	7/15/2012	11:53	29.94	-80.29	57
123438	324	7/15/2012	12:00	29.94	-80.29	56
123439	324	7/15/2012	12:08	29.93	-80.28	55
123440	324	7/15/2012	12:15	29.93	-80.29	55

123441	324	7/15/2012	12:23	29.92	-80.29	54
123442	298	7/15/2012	12:40	29.95	-80.28	65
123443	324	7/15/2012	14:19	29.91	-80.29	55
123444	324	7/15/2012	14:24	29.91	-80.29	54
123445	324	7/15/2012	14:31	29.90	-80.29	55
123446	324	7/15/2012	14:40	29.89	-80.29	53
123447	324	7/15/2012	14:47	29.89	-80.29	54
123448	324	7/15/2012	14:55	29.88	-80.29	54
123449	298	7/15/2012	15:26	29.92	-80.28	65
123450	324	7/15/2012	17:17	29.87	-80.29	54
123451	324	7/15/2012	17:24	29.87	-80.29	53
123452	324	7/15/2012	17:31	29.86	-80.28	55
123453	324	7/15/2012	17:38	29.86	-80.28	55
123454	324	7/15/2012	17:44	29.85	-80.29	52
123455	324	7/15/2012	17:52	29.85	-80.28	54
123456	298	7/15/2012	18:16	29.88	-80.26	80
123457	324	7/15/2012	20:29	29.95	-80.30	53
123458	324	7/15/2012	20:32	29.95	-80.30	54
123459	324	7/15/2012	20:37	29.94	-80.30	54
123460	324	7/15/2012	20:41	29.94	-80.30	55
123461	324	7/15/2012	20:45	29.93	-80.30	57
123462	324	7/15/2012	20:49	29.93	-80.29	54
123463	298	7/15/2012	21:04	29.95	-80.30	53
123464	324	7/16/2012	11:37	30.09	-80.27	55
123465	324	7/16/2012	11:43	30.09	-80.27	54
123466	324	7/16/2012	11:47	30.08	-80.28	54
123467	324	7/16/2012	11:54	30.08	-80.27	63
123468	324	7/16/2012	12:01	30.07	-80.28	54
123469	324	7/16/2012	12:06	30.07	-80.28	53
123470	298	7/16/2012	12:24	30.09	-80.27	66
123471	324	7/16/2012	13:59	30.06	-80.28	54
123472	324	7/16/2012	14:04	30.06	-80.28	54
123473	324	7/16/2012	14:11	30.05	-80.28	54
123474	324	7/16/2012	14:16	30.05	-80.28	54
123475	324	7/16/2012	14:22	30.04	-80.28	56
123476	324	7/16/2012	14:28	30.03	-80.28	54
123477	298	7/16/2012	14:49	30.06	-80.27	68
123478	324	7/16/2012	16:50	30.03	-80.28	54
123479	324	7/16/2012	16:59	30.02	-80.28	54
123480	324	7/16/2012	17:05	30.01	-80.28	55
123481	324	7/16/2012	17:14	30.01	-80.28	55

123482	324	7/16/2012	17:20	30.00	-80.28	56
123483	324	7/16/2012	17:26	30.00	-80.28	54
123484	298	7/16/2012	18:02	30.03	-80.27	67
123485	324	7/16/2012	20:12	29.94	-80.31	52
123486	324	7/16/2012	20:16	29.94	-80.31	55
123487	298	7/16/2012	20:24	29.95	-80.31	53
123488	324	7/17/2012	11:54	30.48	-80.20	58
123489	324	7/17/2012	11:59	30.47	-80.20	59
123490	324	7/17/2012	12:05	30.47	-80.20	53
123491	324	7/17/2012	12:12	30.46	-80.20	55
123492	324	7/17/2012	12:18	30.45	-80.20	60
123493	324	7/17/2012	12:24	30.44	-80.20	57
123494	298	7/17/2012	12:54	30.48	-80.19	64
123495	324	7/17/2012	16:13	30.44	-80.21	54
123496	324	7/17/2012	16:21	30.43	-80.21	59
123497	324	7/17/2012	16:27	30.43	-80.21	54
123498	324	7/17/2012	16:36	30.42	-80.21	52
123499	324	7/17/2012	16:42	30.42	-80.21	63
123500	324	7/17/2012	16:52	30.41	-80.21	56
123501	298	7/17/2012	17:32	30.45	-80.19	71
124800	014	7/10/2012	23:00	30.51	-80.45	38
124801	014	7/10/2012	23:00	30.51	-80.45	38
124802	014	7/10/2012	23:00	30.51	-80.45	38
124803	014	7/10/2012	23:00	30.51	-80.45	38
124804	014	7/10/2012	23:00	30.51	-80.45	38
124805	014	7/10/2012	23:00	30.51	-80.45	38
124806	014	7/12/2012	21:30	29.56	-80.39	41
124807	014	7/12/2012	21:30	29.56	-80.39	41
124808	014	7/12/2012	21:30	29.56	-80.39	41
124809	014	7/12/2012	21:30	29.56	-80.39	41



Figure 1. Chevron trap with video cameras attached over the nose and mouth.

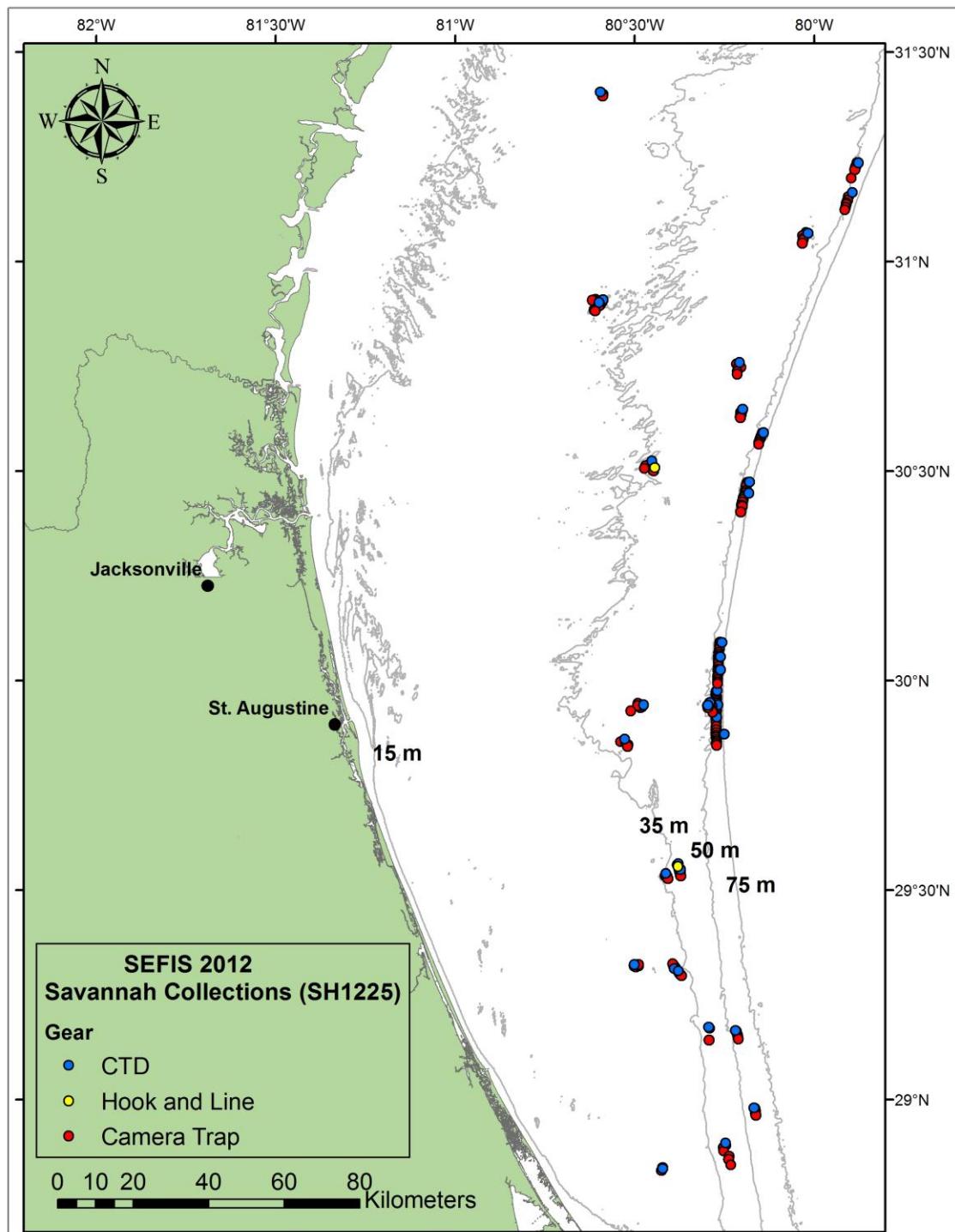


Figure 2. Locations of stations sampled with camera-trap, hook-and-line, and CTD gear on the SH-12-25 survey. Note that symbols overlap in many cases.

Cruise Report Prepared by: Nate Bacheler and Christina Schobernd

Note that the use of trade, product, industry, or firm names, products, software, or models, whether commercially available or not, is for informative purposes only and does not constitute an endorsement by the U.S. Government or the National Oceanic and Atmospheric Administration.